

REMARKS/ARGUMENTS

By this Amendment, claims 1, 21, 24, 32, and 36-39 are amended, and claims 13, 16, 28, 29, and 34 are cancelled without prejudice. Claims 1, 21, 24, and 32 are amended to recite that the suspended and dissolved material is "protein-containing" and that the solid particles separated from the wastewater comprise protein. Support for this amendment may be found in paragraph [0016] of the specification. Claims 1, 21, 24, and 32 are also amended to recite that the solid particles are nontacky. Support for this amendment may be found in paragraphs [0057] and [0060]. Claim 1 is amended to incorporate the subject matter of claim 13 and claim 16. The preamble of claims 36-39 is amended to conform to the other pending dependent claims. New claims 40-42 are added. Support for new claims 40 and 41 may be found in paragraph [0016]. Support for new claim 42 may be found in paragraph [0049]. Applicants respectfully request favorable reconsideration of the rejected claims.

Claim Rejections – 35 USC § 112. The Office Action rejected claims 28, 29, and 34 under Section 112, first paragraph. These claims have been cancelled without prejudice.

Claim Rejections – 35 USC § 103. The Office Action rejected claims 1-8, 10-14, 16-19, 21-34, and 36-39 under Section 103(a) as being unpatentable over Bladen et al. (U.S. Patent No. 5,560,831) in view Allen et al. (U.S. Patent No. 6,428,705). The Office Action also rejected claims 1-8, 10-14, 16-19, 21-34, and 36-39 under Section 103(a) as being unpatentable over Allen et al. in view Bladen et al. Claim 20 was rejected under Section 103 as being unpatentable over Bladen et al. in view of Allen et al. and further in view of Rawlings et al. (U.S. Patent No. 4,144,355). Claim 20 was also rejected under Section 103 as being unpatentable over Allen et al. in view of Bladen et al. and further in view of Rawlings et al.

The foregoing rejections require either Bladen to be modified in view of Allen or Allen to be modified in view of Bladen. In either case, Applicants respectfully submit that one of ordinary skill in the art would not be motivated to combine the teachings of Bladen and Allen as set forth in the Office Action. The waste water treatment processes disclosed by Bladen and Allen are fundamentally different. Bladen teaches a floatation separation process, and Allen teaches a microfiltration separation process. Like many wastewater treatment processes, the Bladen and Allen processes share a few common reactant chemicals, but they also disclose

different reactant chemicals and process steps. Given that Allen discloses a process that forms filterable solid particles and that Bladen discloses a process that forms a floating "sludge," Applicants respectfully submit that a person having ordinary skill in the art would understand and appreciate that the overall chemistries used in the processes of Allen and Bladen are fundamentally different and not interchangeable.

The MPEP makes it clear that the Examiner has the burden of establishing a *prima facie* case of obviousness. *See* MPEP § 2142. If the Examiner fails to establish a *prima facie* case, Applicants are under no duty to submit evidence of nonobviousness. *See id.* The M.P.E.P. states:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure.

Id. Applicants respectfully submit that the Examiner has not met his burden of establishing *prima facie* obviousness.

A. There Is No Teaching or Motivation to Combine Bladen and Allen

One of the key elements to establish *prima facie* obviousness is that there be a teaching or motivation to combine/modify the references to arrive at the claimed invention. *See* MPEP § 2142. No such teaching to combine exists.

According to the Office Action, "Allen teaches a process for treating food processing wastewater," citing column 2, lines 35-40. The "food processing" operations disclosed in Allen include "meat and poultry feedlots and processing operations." Animal feedlot operations are distinctly different than the fruit and vegetable processing operations of the present invention. In particular, wastewater from such animal processing operations contain a variety of contaminants

including “large quantities of suspended organic solids, fats, coliform bacteria, and other organic foulants.” Allen, column 6, lines 60-63. Such wastewater must be treated with one or more oxidizing agents to partially destroy the organic foulants and pathogens. Allen, column 6, lines 63-65. In Allen’s Example 9, cited by the Examiner, the poultry processing wastewater is acidified to a pH of 4 and treated with high amounts of hydrogen peroxide for 10 minutes. Thereafter, ferric chloride is slowly metered over a 20-minute period into the solution. After a one-hour reaction time, the pH was adjusted to a value of 5 and treated with sodium bisulfite to neutralize the hydrogen peroxide. Thereafter, the batch was treated with epi-dma to form filterable particles that are separated from the wastewater by microfiltration.

Bladen, on the other hand, teaches a completely different system that has a completely different separation mechanism. Bladen uses flotation coagulation/clarification and ozonation to clean fruit and vegetable “wastewater.” Bladen’s wastewater is treated with an anionic polyacrylamide, in combination with a metal salt. Anionic polyacrylamide is the generic name for a group of very high molecular weight macromolecules produced by the free-radical polymerization of acrylamide and an anionically charged co-monomer, mainly the sodium salt of acrylic acid, sodium acrylate. Bladen’s use of an anionic polyacrylamide is directly contrary to the present invention. As explained in paragraph [0023] of the present specification:

We studiously stayed away from the high molecular weight acrylamides, both anionic and cationic In the past we have seen some *serious adhesion of the reacted solids to the surface of the membrane* and such adhesion is contrary to the purpose of the invention. (emphasis added).

Thus, from Applicants past experience, anionic polyacrylamides form particles that adhere to the surface of the membrane, rendering them unsuitable for microfiltration. Particles that adhere to the membrane surface may be considered tacky or sticky.

Because Bladen’s wastewater treatment process involves a floatation separation, Bladen’s process chemistry necessarily requires the formation of floating “sludge.” Specifically, Bladen teaches that after the reagents have been added to the wastewater, the wastewater enters a coagulation vessel 69 where “the polymer and coagulated contaminants *float to the top* of the first compartment to form a sludge.” Column 6, lines 58-62 (emphasis added). Generally, such

floatation of the particles is accomplished by the fact that the particles are large and as such, will trap air/oxygen within the large particles. It is this trapping of air within the particles that causes the particles to float and rise the top of the coagulation vessel. Once the particles have reached the top of the coagulation vessel, the particles will form a floatable sludge that may be “skimmed” off the top as a means of separating this sludge from the wastewater. Thus, Bladen separates contaminants from wastewater by floatation, not by microfiltration.

Applicants submit that these fundamental differences between Bladen’s process and Allen’s process are significant and would immediately be recognized by one skilled in the art. The chemistries and purposes of these processes are distinct. In fact, Applicants believe that there is no objective reason that indicates why a skilled artisan, without knowledge of Applicants’ specification, would have been lead to modify Bladen’s floatation separation process (that is applicable to cleaning fruit and vegetable “wastewater”) for use with Allen’s microfiltration system (that is applicable to animal processing wastewater). Similarly, there is no objective reason that indicates why a skilled artisan, without knowledge of Applicants’ specification, would have been lead to modify Allen’s microfiltration system for use with Bladen’s floatation separation method. Simply put, there is no impetus or reason why one of skill in the art would combine Bladen’s floatation separation system with Allen’s system to obtain Applicants’ claimed invention. As such, these two references cannot be properly combined under 35 U.S.C. § 103(a). Withdrawal of the rejections is requested.

B. A Combination of Bladen and Allen (or Allen and Bladen) Would Render Bladen Inoperable and Incapable of Performing its Desired Function or Allen Inoperable and Incapable of Performing its Desired Function

The MPEP explains that if the proposed modification or combination of references would cause one of the references to become inoperable or unsatisfactory for its intended purpose, then this modification/combination is improper and may not be used to reject the applicants’ claims under 35 U.S.C. § 103(a). *See* MPEP § 2143.01; Applicants Amendment, dated September 1, 2005, pages 13-15. Applicants submit that in the present case, the proposed combination of Bladen and Allen (or Allen and Bladen) is improper in that this combination would render

Bladen inoperable and unsatisfactory for its intended purpose or Allen inoperable and unsatisfactory for its intended purpose.

Specifically, as noted above, Bladen system uses coagulant polymers, specifically anionic polyacrylamides, that when mixed with the “wastewater,” produce a floatable “sludge.” Bladen, Column 6, lines 58-62. From Applicants past experience with anion polyacrylamides, such coagulated materials are tacky and adhere to microfiltration membranes, rendering them unsuitable for microfiltration. *See*, Specification, paragraph [0023]. However, Bladen’s system requires the coagulated materials to capture air molecules and float to the surface in the separation chamber. It is this floatation of the particles that allows Bladen’s system to perform separation.

In contrast, Allen’s process chemistry forms solid particles that are separated by microfiltration. Allen’s waste particles do not float, but are heavy and settle. Indeed, Allen discloses that the solids gradually become packed on the membrane surface and are removed by backflushing. The “rejected solids are gravity collected at the bottom of the filter vessel.” Allen, column 8, lines 20-24. Allen’s particles settle to the bottom and do not float.

In summary, because Allen’s chemistry forms solid, heavy particles, if Bladen’s process were modified to use Allen’s process chemistry, then Bladen’s process would be inoperable and incapable of performing its desired function because the resulting waste particles would not float. Likewise, because Bladen’s chemistry forms a floating sludge that adheres to microfiltration membranes, if Allen’s process were modified to use Bladen’s process chemistry, then Allen’s process would be inoperable and incapable of performing its desired function because the resulting waste particles would float (and not settle) and adhere to the microfiltration membrane.

Accordingly, the combination of Bladen and Allen is improper and may not be used to reject the Applicants’ claims under 35 U.S.C. § 103(a). Withdrawal of this rejection is respectfully requested.

Rejection of Claim 20. As noted above, the Examiner rejected claim 20 under 35 U.S.C. § 103(a) as being unpatentable over Bladen in view of Allen and in further view of Rawlings AND as being unpatentable over Allen in view of Bladen and in further view of Rawlings. This rejection is respectfully traversed.

It is well settled that if an independent claim is patentably distinct from the cited prior art, then all claims that depend from that patentable independent claim are likewise patentable. *See* MPEP § 2143.03 (“[i]f an independent claim is nonobvious under 35 U.S.C. 103 then any claim depending therefrom is nonobvious”). In the present case, claim 20 is a dependent claim that indirectly depends from independent claim 1. As described above, independent claim 1 is patentable distinct from the cited prior art. Accordingly, Applicants submit that dependent claim 20 is likewise patentable over the cited art of record. Withdrawal of this rejection is respectfully requested.

Claim Amendments. Despite what the Examiner may state in the Office Action, Applicants submit that the cited Allen patent is more relevant to the present invention than the Bladen patent. Indeed, Bladen’s floatation separation process is technically so different than the claimed invention that it is not really relevant to the present invention. Nevertheless, the claims were amended to clarify the invention and more clearly differentiate it from Allen and from Bladen. As mentioned above, the claims were amended to recite that the suspended and dissolved material is “protein-containing” and that the solid particles separated from the wastewater comprise protein. Neither Allen nor Bladen discloses or suggests that the separated waste particles comprise protein. The separated solid particles obtained according to the present invention are not merely waste particles to be discarded, but are valuable protein-containing materials that are collected and used for various purposes. New claims 40-42 further emphasize this concept. Indeed, claims 41 and 42 refer to two different uses of the collected and separated solid particles that are neither disclosed nor suggested by Allen and Bladen.

The claims were amended to recite that the solid particles are nontacky. This amendment is intended to more clearly differentiate the Bladen patent, particularly Bladen’s disclosed and claimed use of anionic polyacrylamide which results in “serious adhesion of the reacted solids to the surface of the membrane and such adhesion is contrary to the purpose of this invention.” Specification, paragraph [0023].

The claims were amended to incorporate the subject matter of claim 16, reciting a dwell time between 5 and 30 minutes. The Allen patent, Example 9, reports a dwell time of at least 1.5 hours (10 minute hydrogen peroxide treatment, 20 minute slow addition of ferric chloride, one

hour reaction time, plus the addition of sodium bisulfite, and epi-dma). The Bladen patent does not disclose a dwell time, but given that Bladen's process requires time for floatation separation, it is likely a lengthy dwell time. The Examiner argues that dwell times are "optimizable" and within the level of skill in the art. It may be assumed that Allen is an inventor within the level of skill in the art and that Allen's reported dwell time is, therefore, optimized. Because Allen's reported dwell time is substantially different than the claimed dwell time, it follows that the claimed process is substantially different than Allen's process. Of course, Allen's process is substantially different than the claimed invention because Allen's process includes reagents and process steps to address the coliform bacteria, fats, and foulants associated with the poultry processing operation, which are not present in the fruit and vegetable wastewater according to the present invention. Therefore, the claimed process, including dwell time, would not have been obvious from Allen's disclosure.

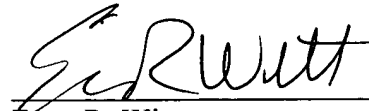
The claims were amended to incorporate the subject matter of claim 13, reciting the ratio of coagulant inorganic polymer to synthetic organic polymer. The Allen patent, Example 9, discloses a ratio of 2:1, which is well outside the recited ratio ranging from 5:1 and 25:1. According to the Office Action, the Bladen patent discloses the claimed ratio. However, as discussed above, the chemistry used in Bladen's process cannot be combined with Allen's process chemistry because they produce totally incompatible results (floatable sludge vs. filterable solid particles). Because of the incompatible disclosures of Bladen and Allen, Applicants submit that the subject matter of claim 13 would not have been obvious from the combined teachings of Bladen and Allen.

Finally, the equation recited in claims 6 and 21 would not have been obvious from the combined disclosure of Bladen and Allen. The Office Action acknowledges that the combined disclosure of Bladen and Allen fails to teach the equation, but according to the Examiner, the equation is merely "an optimum value of a result effective variable." Applicants respectfully disagree. The equation describes the complex interaction of three variables in wastewater: BOD, COD, and TSS. The discovery of this equation is not optimization of a result effective variable as described in the court decisions cited by the Examiner.

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In view of the foregoing, Applicants respectfully submit that the pending claims would not have been obvious from the prior art of records, regardless of how the references are combined. Applicants respectfully request withdrawal of the rejections and allowance of the pending claims. If there are any remaining issues preventing allowance of the pending claims that may be clarified by telephone, the Examiner is requested to call the undersigned.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "E. R. Witt", written over a horizontal line.

Evan R. Witt
Reg. No. 32,512
Attorney for Applicants

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MADSON & AUSTIN
Gateway Tower West
15 West South Temple, Suite 900
Salt Lake City, Utah 84101
Telephone: 801/537-1700